STATE OF CALIFORNIA

ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

In the Matter of:	)	Docket No.02-IEP-01
Informational Proceedings and	)	
Preparation of the 2003	)	
Integrated Energy Policy Report	)	Date: December 23, 2002
_____	)	

STAFF RESPONSE TO COMMITTEE SCOPING ORDER

Overview

This memorandum sets forth the Staff's workplan to address the questions asked in the Ad Hoc *Integrated Energy Policy Report* Committee's scoping order of December 16, 2002. The Committee directs staff to focus on "the need to maintain a strong energy infrastructure." Energy infrastructure is meant "to capture the full range of investment in production, transmission, distribution, and demand." (Committee Order at pages 1 and 2).

The *Integrated Energy Policy Report* is the culmination of all the subordinate work and is intended to present a comprehensive and integrated view of the state of the State's energy system and the most demanding policy decisions. Supporting the integrated report are three subordinate reports: *The Electricity and Natural Gas Assessment; The Transportation, Fuels, Technologies and Infrastructure Assessment; and The Public Interest Energy Strategies Assessment*.

Staff's workplan separates the work into the integrated context and the sector-specific information necessary to develop a comprehensive picture of California's energy markets. The work described here must be started now in order to have results available for the Committee's schedule. As this Proceeding develops, additional tasks may become necessary.

Integrated Context

Many similar concerns cut across all energy sectors. California's expanding population and economy drive a continuing demand for new energy or energy-reducing products. For each sector, we need to identify the current adequacy, reliability, and price of resources. Options for meeting or reducing that demand need to be considered, along with the economic, environmental and public health consequences.

Increasingly, we need to make a better assessment of the potential risks. The electricity and natural gas markets are more tightly linked than before, and the consequences of adverse developments in one sector can quickly spread and magnify in another. Public and private investments in energy efficiency and renewable energy are closely tied to the structure and price of the electricity and natural gas markets. We cannot develop effective policies unless we take into account these cross-sector ties.

The energy-environmental balance will need to be assessed in an integrated context. Staff proposes to provide two baseline assessments for environmental indicators and global climate change:

- Overall environmental-energy balance and indicators. Environmental impacts of electric generation, natural gas and transportation fuels and infrastructure will be addressed in the sector-specific reports.
- The comprehensive discussion of global climate change: Sector-specific strategies will be summarized here and discussed in detail in the sector reports.

A final cross-cutting subject that will provide an overall context is exploring alternative visions for California's electricity future. This study should describe potential futures, identify key drivers, and identify actions that would make different futures more likely to occur.

Context Products

1. What aspects of California's energy supply contribute the most to public health and environmental concerns?

   This documentation of the relative contribution of various energy sectors will provide a framework for targeting attention. Working with other state agencies, Staff shall update selected indicators from the Environmental Protection Indicators for California Report (California Environmental Protection Agency and California Resources Agency, 2002).

   Schedule: Staff will produce a draft product in June 2003.

2. What are the implications of global climate change on California's energy system?

   Staff will report on available knowledge on the impact of climate change on California's energy system such as water availability for power plant cooling, snow pack and water for hydropower, significant variations in electricity use patterns due to climate shifts, and generation adequacy. The description will include timelines of when these effects are likely to become pronounced, and how they will interact with normal climate variation. The report shall also summarize progress in reducing the statewide production of greenhouse gases

Climate change analyses should be consistent and well coordinated with other on-going, statewide planning efforts. Staff will work with ongoing efforts at OPR on guidance for General Plans as well as revisions to a comprehensive "State Environmental Goals and Policy Report" under AB 857 (2002). Staff will also consult with ARB on their on-going proceeding on their greenhouse gas emission inventory.

Schedule: Staff product available for public review May 2003.

3. How do we want California's energy systems to look in the next 5, 10, and 20 years? How compatible is California's existing infrastructure with this long-term vision and what barriers does California face in a transition to the long-term vision?

   Over the next year, the State will be articulating views on the preferred market structure for securing a reliable energy system. Proceedings currently before the California Public Utilities Commission, the Federal Energy Regulatory Commission, and the courts may dramatically alter the regulatory and financial landscape for the electricity industry in the near future. In turn, these changes will also affect the natural gas industry, the renewables industry, energy efficiency opportunities, environmental impacts and public health consequences.

   Staff will work with other state agencies and interested parties to promote a public discussion of this issue. The baseline forecasts will provide a starting point by characterizing the current infrastructure. We will convene a workshop and invite a panel of outside experts to provide their insights on infrastructure goals, the key drivers that are likely to make various futures more likely, and the market design necessary to attain various goals.

   Schedule: The workshop will be convened in April 2003 and a staff assessment will be provided for public review in June. The Committee will issue further direction.

Electricity and Natural Gas Assessment

During much of 2003, stakeholders will be focused on cleaning up the overhang of regulatory decisions; capital concerns and court cases which are the legacy of the 2000 -2001 electricity crisis. Due to the tight ties between natural gas and electricity, financing and capital problems have also destabilized the natural gas market. In this climate, California must re-establish its vision of the future electricity and natural gas sector.

Electricity and Natural Gas Trends and Outlooks[1]

1. What is the expected electricity and natural gas demand over the next 10 years?

   Staff will develop baseline and reasonable alternative electricity and natural gas demand forecasts for 2003 through 2013. The California demand studies will describe disaggregated and statewide consumption. Baseline electricity and natural gas demand forecasts will be compiled for the rest of the West

   The demand trends analysis will reflect a band of plausible demand cases, depending on economic and energy efficiency ranges. These cases will be used to examine the sensitivity and impacts of different resource development options and public interest policies. These cases include:

   - How will demand be affected by the economy and energy prices? For electricity and natural gas, staff will develop two scenarios:
     - A strong economic recovery with low gas prices and declining Demand-Side Management (DSM) scenario; and
     - A slow or delayed recovery with high gas prices and high DSM scenario that would represent a reasonable lower bound for expected demand.
   - What is the effect of weather on electricity and natural gas demand? Results will be used to develop a monthly gas demand forecast under various weather conditions.

   For the natural gas demand forecast, staff will also examine a scenario with strong economic growth, higher gas prices, and low persistence of voluntary conservation. Staff shall consider California Gas Report forecasts and collaborate with interested parties in developing the forecasts.

   Schedule: Staff will prepare a preliminary baseline demand forecast and proposed drivers for scenarios by February 2003. These forecasts will be subject to public review. As a result of the review, the baseline forecast may be revised and selected sensitivity cases will be prepared.

2. What changes in electricity and natural gas infrastructure are likely to occur in the next 10 years?

[1] In keeping with the direction of the *Integrated Energy Policy Report* to coordinate with other state agencies and the California Public Utilities Commission's direction that utilities should work with the Energy Commission in preparing their long-term resource plans (CPUC D. 02-10-062, mimeo at 17), staff will exchange draft trends and outlook materials with investor-owned utilities. To the extent that these materials will be filed confidentially at the CPUC, we will carry over the same confidentiality restrictions into this proceeding, consistent with Title 20, Section 2505.

Staff will document the progress of new electricity generation, transmission, gas pipelines and gas storage projects in California and throughout the West. This shall address recent declines in generation project development activity.

Schedule: Staff product due for public review: February 2003

3. What are the expected costs of new generation sources?

   Staff will prepare an estimate of the costs of new gas-fired and renewable generation, which shall be used in the issues, analyses. This shall address the recent declines in project development activity.

   Schedule: Staff product due for public review: January 2003

4. What are the environmental implications of existing and new electrical generation?

   Staff shall prepare the Commission's second Environmental Performance Report. It will assess the environmental performance of the California electric generation facilities. This will include environmental profiles of the state's main power generation sectors. The Report shall assess generation facility efficiency and air emission control technologies that are in use. It will discuss the factors that affect the extent to which resource additions displace or reduce the operation of existing facilities. The report will also address the geographic distribution of statewide environmental, efficiency, and socioeconomic benefits and drawbacks of existing generation facilities. As an expanded feature, it will present preliminary information on the state's electric transmission and natural gas pipeline systems.

   Schedule: Staff product for public review is due in July 2003.

Electricity and Natural Gas Issues

5. How adequate is our electricity supply when considering key uncertainties and the need for energy-environmental balance? Are additional State actions needed?

   Staff shall produce outlooks for the short-term (2003-2005) and long-term (2006-2013) electricity supply adequacy risks, considering potential supply uncertainties and the varying demand scenarios listed above. New generation additions, retirement of older generation, and demand participation over the long-term may vary depending on:

   - The number of long-term capacity commitments to cover part or most of a load serving entity's electricity demand,
   - The success of implementing renewable technology programs,

- Market design changes and price volatility that affect the incentives to commit new investments,
- The potential for limited new investment due to the overhang of regulatory and court cases as well as credit and liquidity problems,
- The value of replacing or retiring older and less efficient generation facilities,
- The opportunity to increase demand elasticity through dynamic tariffs, and
- The effectiveness of energy efficiency efforts and load management programs to moderate growth.

Staff will identify electricity resources that could meet the baseline demand forecast through 2013. This built-out resource plan shall be tested under most-likely conditions and with key uncertainty variables. These variables would include low hydro generation, high/low peak demand levels, and high/low fuel prices. This resource plan would bound several potential supply adequacy futures and gives a sense of the impact of various uncertainties on adequacy, reliability and market prices. Staff will examine ongoing CPUC and CPA proceedings for relevant information and decisions. As described in Issue 9, staff shall examine the environmental content of these resource scenarios.

Schedule: Staff will hold a workshop on its proposed scenarios in early March. The staff product is due in June 2003 and will be subject to a public hearing, at which time other parties will be invited to file comments and alternative views. The Committee may direct revised cases for the final Electricity and Natural Gas Report.

6. What regional and statewide transmission upgrades would most benefit California? If transmission upgrades are in California's interest, what state actions are appropriate?

   California's transmission system has bottlenecks that impede the flow of electricity intra- and interstate. Some of these constraints cause reliability problems for the grid, while others restrict the amount of lower cost electricity that can be imported into an area. Several "fixes" have been proposed by the utilities, the ISO and transmission entities, including: upgrading Path 15, upgrading Path 26, building the Valley-Rainbow interconnection, and upgrading Path 46 that links Southern California with Nevada and Arizona.

   Using the findings in ISO, CPUC and FERC proceedings, as well as the activities of the western Regional Transmission Organizations, staff will report on the merits of these proposals. These projects will be used as illustrations of what might be accomplished through a more integrated transmission-planning framework.

   Based on lessons learned in recent transmission upgrade proposals, staff shall work with the ISO, the Electricity Oversight Board and the CPUC to develop possible actions the State could take to facilitate improved transmission planning, siting, and construction.

Schedule: Staff products are due for public review in June 2003.

7. How will retail electricity prices affect consumer choices and the electricity system?

   One of the main purposes for deregulating the electricity industry was to lower electricity rates for California customers. Yet, today's rates have increased by 2.5 to 3.0 cents per kWh and average customer electricity bills are up to 50 percent higher than before deregulation. Staff will prepare a ten-year projection of retail electricity rates for customers of the major investor-owned and municipal utilities.

   The forecasts will be used in analysis of the Public Interest Energy Strategies. Retail price forecasts can be used to estimate the cost-effectiveness of energy efficiency and distributed generation alternatives. The composition of rates can have important impacts on consumer choices to avoid high electricity costs. A larger portion of the electricity rate components is now composed of fixed and unavoidable costs compared to a number of years ago. Investments in co-generation, self-generation, energy efficiency and renewable energy equipment currently appear more appealing to some customers.

   Of course, the structure of retail rates is subject to regulatory decisions and will change over time as policy-makers balance the multiple ratemaking goals. The staff outlook will give a picture of how current rate structures might influence consumer behavior. This can help policy-makers decide whether they want to change rate structures.

   Schedule: Staff's preliminary baseline electricity price forecast will be available for public review in February 2003. As a result of the review, the baseline forecast may be revised in May 2003.

8. What steps should California take to mitigate the risks associated with natural gas price volatility, the potential for price shocks, and the close ties between the natural gas markets and the electricity markets? When will increased natural gas infrastructure be needed?

   In the natural gas sector, competitive market forces have led to a volatile pricing trend that creates uncertainty in the energy markets. This uncertainty has also altered the typical supply and demand trends of the last decade. Staff will address the impact of changes in demand trends on price and supply availability, and identify the sources of risks associated with price and supply of natural gas resulting from a variety of weather, economic and regulation related changes in the gas marketplace.

   Since 2000, significant additions have been made to the intra-state, inter-state pipeline and storage capacities in California. New opportunities are now being considered for increased access to Rocky Mountain and Canadian gas and to

potential imports through Liquefied Natural Gas facilities (LNG) facilities. These facilities may be located in California, Baja California and/or the Gulf Coast.

Recent changes in regulatory rules, increasing convergence between natural gas and electricity markets and recent infrastructure additions will create a new pattern of reliability, price, and environmental risks. Staff accordingly will propose an integrated risk analysis framework to systematically study the trade-off in infrastructure supply and price risks that are needed for evaluating these and related alternatives. This framework will take into account the relationship between these different kinds of risks, as well as how California's exposure to such risks may be increased because of covariation in the recurring pattern of extreme temperature and hydro conditions between California and other regions.

The framework will clarify how the analysis in this report may be extended in future policy reports in order to develop approaches to improve the impact of these risks. Such approaches may include analytical benchmarks and policies that foster greater short-term price elasticity of market response in coping with price shocks, and timely long–term investment in adequate infrastructure. To initiate the implementation of this risk oriented framework, the natural gas analysis in this IEPR will begin by focusing on questions, such as:

- What is the potential for gas curtailments and how does the range of variability in gas demand, including generation requirements, affect (exacerbate or mitigate) that potential?
- How do different mixes of supplies, storage, pipelines and policies affect exposure to the identified price, shortage and environmental risks?
- Is State action needed for the siting of pipelines or import facilities?
- How will California's price and supply availability be affected by the regional shifts in gas consumption due to increased gas-fired power generation and increasing seasonal demand in the neighboring states?

Schedule: Staff will produce a draft report by April 2003 and hold a workshop for public comment. Other parties shall be invited to present their independent analyses. Staff's final product is due in June 2003.

9. Are additional state actions needed to the electricity and natural gas infrastructure to further protect the environment and public health concerns?

Energy production, transmission and use affect all parts of California's natural environment. Emissions from the electricity and natural gas infrastructure in California have been substantially reduced over the past 25 years, yet many parts of the state still do not meet federal standards for healthy air for most of its population. Increasing demands on limited water supplies and societal concern about water quality and aquatic ecosystems are major public policy issues in California and the arid West. Water is a key element for energy production, and water allocation among competing uses is becoming increasingly difficult. As with water, California is placing increasing demands on limited land resources to support housing, commerce, energy production,

agriculture, transportation, recreation and open space. Concurrently, societal concerns about protecting and restoring sensitive ecological habitats are increasing. Energy policy must compliment the State's environmental and public health initiatives.

Energy and environment issues have two elements: regulatory constraints on energy production, transmission and use in order to protect environmental quality and public health, and impacts of the energy system to the natural environment. Using the electricity resource scenarios developed in Issue 5, staff shall examine:

- Given that state and federal air quality regulations have substantially reduced emissions from power plants, can additional air quality improvements be achieved from new pollution controls, or are other strategies more effective for improving air quality?
- Will a slowdown in new project development affect the current trend for improved environmental conditions from the use of efficient electricity generation technologies?
- Are new policies needed to reduce the use of water and impacts to water from power generation? What effect will state and local water policies have on the design of new and retrofit generation facilities?
- What are the environmental, land use and public health effects from a potential major expansion in the state's electricity grid and/or natural gas supply system?
- Have California's environmental review requirements been a factor for deterring new electricity generation?
- What are the environmental impacts and public health effects of a major increase in renewables generation technologies? Are such impacts counterbalanced by environmental and energy supply benefits from additional renewable energy? This analysis will be tied into the Renewable Portfolio Standard analysis (issue 7) in the Public Interest Energy Strategies Report.

Which environmental indicators should be developed to measure progress in policy initiatives that are intended to reduce environmental impacts from energy production, transmission and use?

Schedule: Staff's product will be available for public review in June 2003.

10. What is the relationship between the hydropower system and opportunities to improve environmental quality without unduly affecting energy supplies or costs?

To improve our understanding of the nexus of the energy-environmental balance in the use of water for hydropower and other uses, staff will work with other agencies and interested parties to explore opportunities for improving our ability to meet multiple water use demands.

Staff will prepare a report to characterize capacity, reliability, and dispatchability of the state's hydropower resources.

Hydro's importance and continued availability for peaking energy and ancillary services will also be evaluated. Constraints on energy production and environmental consequences of hydro generation will be summarized to the extent that comparable data on existing conditions can be systematically collected.

Staff will present this report and results from recent PIER research on FERC hydro relicensing cases at a public workshop. Parties will be invited to present their own research and recommendations.

Schedule: Staff's preliminary products will be provided for an April workshop, with a final product due in July 2003.

Transportation Fuels, Technologies and Infrastructure Assessment

Preparation of this component of the ***2003 Integrated Energy Policy Report*** will be greatly aided by the current California Air Resources Board (CARB) – California Energy Commission (Commission) joint study on **Strategies to Reduce Petroleum Dependence** and the Commission's study on a **California Strategic Fuels Reserve**. Both of these studies are required by AB 2076 (Chapter 936, Statutes of 2000). Another legislatively-mandated study, AB 2098 (Chapter 963, Statutes of 2000), will also be used to prepare the transportation component of the ***2003 Integrated Energy Policy Report*** by evaluating the economics of enhancing petroleum product supply through expansion of interstate pipelines to meet California fuel demand. From work completed in these studies, we already have the baseline trends and the identification of options to reduce petroleum dependence. We have identified the most pressing current transportation fuels issues, some emerging problems for 2005 – 2006 and the need to lay the groundwork for our longer-term transportation fuels and infrastructure vision.

Transportation Fuels, Technologies and Infrastructure Trends

In the ***Strategies to Reduce Petroleum Dependence*** proceeding, staff developed a 20-year California baseline forecast for transportation fuel supply demand and price. This revealed five major energy trends:

a. Continuing growth in transportation fuels demand – Given population and economic growth, the base case forecasts average annual demand growth of 1.6 percent for gasoline, 2.4 percent for diesel and 3.4 percent for jet fuel. With projected long-term prices ($2001) of $22.50/barrel for crude oil and $1.64/gallon for gasoline (including $.15/gallon adder due to dependency on imported products), vehicle miles traveled are forecast to increase 1.8 percent annually.

b. Federal efficiency standards are stable – The forecast assumes no improvement in fuel economy for new highway vehicles. New policies and actions will be needed if these trends are to be re-established.

c. Transportation continues to rely on petroleum fuels – Crude oil will continue to be the dominant source of transportation fuels over the next 20 years. Measures to reduce carbon emissions, potential price increases in crude oil due to higher demand, and policy initiatives may begin to stimulate significant use of other fuels for transportation.

d. Increases in California refinery capacity will only be incremental – The relatively high costs and environmental constraints of a new refinery in California will probably preclude the construction of additional refineries. Recently, incremental additions of about one percent have aided California's ability to meet demand for petroleum products. While there may be limited opportunities to increase production, California's demand for refined products will likely grow at a rate faster than the growth in its refining capacity.

e. Growing reliance on imported fuels – With the effective loss of refinery capacity due to Methyl Tertiary Butyl Ether (MTBE) phase-out and demand growth, transportation in California will rely increasingly on fuels imported from foreign sources in the near-term. Growing imports increase the need for additional marine terminal and pipeline infrastructure capacity, with attendant environmental and public health concerns.

For the ***2003 Integrated Energy Policy Report***, staff will prepare four trends analyses.

1. Staff will update the baseline transportation energy forecast that is consistent with the key economic and population drivers used for the electricity and natural gas forecasts and incorporates recent data.

   Schedule: Staff will prepare an updated baseline forecast of transportation fuel supply and demand by May 2003.

2. Trends in Alternative Fuels and Refueling Infrastructure – Staff will summarize the current growth of alternative fuels, technologies and refueling infrastructure. These trends will be used in analysis as directed below.

   Schedule: Staff will prepare a trends analysis of alternative fuels, technologies and refueling infrastructure by March 2003.

3. Trends in Air Quality Impacts – Staff will provide a baseline assessment and forecast of the role of transportation fuels in emissions of criteria pollutants.

   Schedule: Staff will prepare criteria pollutant emissions forecasts of transportation fuel use by March 2003.

4. Trends in Global Climate Change Impacts – Staff will provide a baseline assessment, using its recently updated California greenhouse gas emission inventory, of the role of transportation fuels in greenhouse gas emissions.

   Schedule: Staff will prepare a baseline trend of greenhouse gas emissions from the California transportation sector by March 2003.

Transportation Energy Issues

The State's transportation energy goal is to resolve energy issues that adversely impact the California transportation energy sector to ensure clean, adequate, affordable and reliable transportation energy that supports a healthy economy. These choices are circumscribed by federal transportation policies, such as vehicle efficiency standards, and by the global vehicle and petroleum markets.

As the ongoing AB 2076 and Executive Order D-52-02 (Governor's Executive Order directing CARB to implement regulations to phase-out MTBE from California's motor gasoline) proceedings have demonstrated, the most immediate issue in dealing with the phase-out of MTBE and the growing demand for gasoline is the need to provide additional supply of petroleum products in 2003 and 2004. An emerging issue - transition to low-sulfur diesel and gasoline – is to be addressed so that we do not have further major disruptions in fuel prices in 2005 and 2006. Longer-term issues that will impact the future direction of California's transportation energy system will address both demand and supply. Actions can be taken now to lay the foundation for fulfilling long-term goals. As the AB 2076 analysis is completed next spring, staff may be directed to address other emerging issues.

Current Transportation Energy Market (2003-2004)

California is currently confronted with potential gasoline supply shortages, which require actions to ensure adequate supplies of petroleum-based transportation fuels are available to the California motorist. Immediate State efforts need to focus on maintaining adequate supplies of current, conventional fuels, while developing longer-term fuel substitution and demand reduction options. The current issues confronting the State's transportation energy sector are in the delivery of petroleum, petroleum products and blending stock to California.

5. What changes are needed at California ports and to pipelines to meet the near-term demand for increased imports?

   Projected reductions of in-state fuel production and the supply impacts from the phase-out of MTBE, combined with growing demand for gasoline, will lead to increased imports. An initial assessment of California's marine and pipeline fuel infrastructure shows the system's capability to accommodate additional imports may require new actions by industry or by government.

   Staff will conduct a detailed investigation of the number of additional tankers and possible increased supporting infrastructure needed at marine terminals to meet demand. Staff will identify actions the State and others can take to help resolve some of the capacity constraints. Staff shall identify environmental and public health concerns arising from increased imports. Based on those analyses, Staff shall recommend an integrated plan for actions by the State and others.

   Schedule: Staff will prepare the marine infrastructure report for public review by January 2003.

6. Will new petroleum pipelines from Texas take over supplying the fuel needs of Southwest states, thereby freeing up fuels refined instate?

   Nevada and Arizona get most of their transportation fuels from California refineries. Arizona also receives gasoline and diesel by pipeline from Texas. The pipeline from El Paso, Texas to Phoenix, Arizona is nearly at full capacity.

All new demand in Arizona must be supplied from a pipeline originating in California. Expansion of the East Line Pipeline from El Paso, Texas to Phoenix, Arizona, along with the completion of the Longhorn Pipeline, would displace Arizona's demand for California-produced transportation fuels allowing for increased availability for use within California. But the volume of displaced gasoline and diesel supplies for California use could be diminished by the eminent adoption of more stringent gasoline and diesel specifications for Arizona and regional demand increases in Western Texas and New Mexico.

Staff is examining the likelihood of this pipeline expansion, the potential risks associated with planning on it as a means to reduce supply constraints, and whether it lessens the need to take other actions.

Schedule: As part the AB 2098 proceeding, Staff will prepare a revised draft report on pipeline expansion by January 2003.

7. What are the economic impacts of options that have the potential to reduce the magnitude of future gasoline price spikes in California?

Californians have experienced several retail gasoline price spikes over the past seven years. The primary cause has been unplanned refinery outages that temporarily tighten supply. The next source of gasoline, that meets CARB's fuel specifications, requires 2 to 6 weeks to ship to California. A month-long price spike of 10 cents per gallon costs California consumers nearly $120 million. The State has already experienced rapid increases in price that are five times greater, costing consumers over $600 million per event.

It may prove beneficial to California's economy to dampen gasoline price volatility in California. A cost/benefit analysis of options to dampen price volatility needs to identify the net value of reducing gasoline price volatility. The value of reducing diesel volatility may be less clear as California and national diesel price volatility appear similar.

Several options have the potential to mitigate the severity of these price spikes. Staff is analyzing and comparing the risk, reliability and value to establishing a strategic petroleum reserve, streamlining the permit process associated with petroleum storage projects and developing more efficient forward buying markets as steps that could be taken by California to affect changes to the market that could benefit the State's consumers.

Schedule: Staff will prepare a draft report on alternatives to reduce gasoline price volatility for public review by March 2003.

8. What additional actions will be needed so that California will not be adversely impacted by the national shift to lower-sulfur diesel and gasoline fuels in 2006?

Federal regulations will require lower sulfur levels in gasoline and diesel fuel. Due to costs, some U. S. refineries will close. Additional volumes of relatively

clean gasoline and blending components will need to be imported to replace this lost capacity and meet growing demand. More stringent fuel specifications will also increase demand for specific types of gasoline components that are low in sulfur and possess desirable distillation properties. California refiners will have to compete for these types of blending components, potentially constraining availability to help meet California's growing demand. Potential impacts may affect smaller suppliers and consumers more.

Working with CARB, staff will develop recommendations on safeguards against fuel shortages, outages and extreme price swings. The report shall describe the environmental impacts of this new requirement.

Schedule: Availability of staff issue paper on possible supply impacts to California gasoline and diesel supplies is dependent on federal and state air quality regulatory schedules, which are anticipated to begin in 2003.

Mid-term Transportation Issue (2005 – 2006)

9. Will a possible federal energy bill be beneficial or detrimental to California's supply and availability of transportation fuels?

Passage of a federal energy bill may mandate a national phase-out of MTBE and require a Renewable Fuels Standard (RFS). A national phase-out of MTBE could reduce gasoline supplies in the U.S. by approximately 5 percent. More importantly, the superior blending properties of MTBE will need to be replaced with similar gasoline components. Unfortunately, these blending components are usually scarcer and more expensive than traditional gasoline. A national phase-out of MTBE is therefore expected to constrain gasoline supplies and availability of imports, a development that is expected to increase gasoline costs for California motorists.

A national RFS could increase demand for ethanol by nearly 300 percent by 2012. If the federal minimum oxygen requirement is not waived, most of California's gasoline will require the presence of ethanol (the only oxygenate permitted under the Phase 3 reformulated gas regulation). The RFS mandate is anticipated to increase demand for ethanol, increasing the market price for U.S. refiners. Credit-trading provisions, if properly crafted, could improve flexibility of compliance and potentially mitigate some of the price impacts associated with this requirement.

If a new federal law is enacted, Staff shall analyze the transportation energy provisions and impacts, including potential for increased opportunity for expansion of ethanol production in California.

Schedule: Staff background paper on possible ethanol and gasoline supply and price impacts to California will be provided by April 2003.

Future Transportation Energy Market

In the longer-term, as petroleum continues to be depleted, the price of transportation fuels will continue to increase. Fuel price increases will be affected by continued transportation fuel demand growth and increasing oil production costs. Reliance on a single fuel, oil, has the potential to exacerbate future conditions of increasing fuel prices. The longer-term issue facing California's transportation energy sector is the economic and environmental impacts of maintaining the status quo compared to transitioning to other options, such as hydrogen.

10. What methods affecting transportation energy demand merit consideration and emphasis to improve the State's ability to support clean and reliable transportation service and a stable and healthy economy?

    Reducing the rate of growth of energy consumption moderates the economic impact of higher energy expenses for all consumers. It also reduces the rate of growth in fuel demand and the need for new sources of fuel supply to meet that demand.

    Staff is evaluating which petroleum reduction options, or combination of options, should be pursued to dampen the demand for petroleum fuels and to achieve price stability in the transportation fuels market. Ways to reduce the rate of growth in gasoline and diesel demand being explored include quantification of their environmental costs and benefits, from a multi-media perspective.

    Staff shall evaluate the lack of an alternative-fueled vehicles refueling infrastructure as a major barrier to commercialization.

    Schedule: Staff will prepare a report, as part of the AB 2076 proceeding, for public review by February 2003.

11. Are there cost-effective actions that the State should take to increase the market share of more efficient vehicles in California?

    Having developed improved vehicle technologies to meet existing federal fuel economy standards for light-duty vehicles, the automotive industry has historically converted additional gains in energy efficiency to improve vehicle performance and provide additional benefits. These improvements include increased power and torque, greater carrying capacity, and increased comfort. Due to increased consumer preference for light trucks (including minivans and sport utility vehicles) versus passenger cars, the average fuel economy of new light-duty vehicles is declining.

    Although hybrid vehicle models are now being introduced with significantly improved fuel economy, the automotive manufacturers have no incentive to improve vehicle fuel economy across their entire product line or go beyond the current fleet-wide average standards. Based on past experience, the improved

fuel economy in a fraction of the new car fleet will be used to offset lower fuel economy in the balance of the new car fleet.

Staff analyzed and will recommend strategies to improve vehicle fuel economy based on the costs and benefits to society, and to the consumer. Staff has also quantified the petroleum reduction impacts and relative costs of various vehicle technology packages, including vehicle fuel economy measures and hybrid electric vehicles.

Schedule: Staff will prepare a report, as part of the AB 2076 proceeding for public review by February 2003.

12. What combination of State actions and policies result in a transportation energy system that cost-effectively reduces the state's reliance on petroleum fuels in comparison to base trends?

Alternative views regarding the resource status of crude oil dominate energy planning scenarios. Each position is based upon experts and knowledgeable organizations. In one case, energy providers continue to improve the recovery rate from existing oil resources and develop new resources at a rate to meet energy demand in an orderly manner over the next 40-50 years.

In the other case, world crude oil production peaks by perhaps 2020-2030 and oil prices would increase to new levels. Higher prices would spur large-scale production of non-conventional petroleum-based fuels and other alternative fuels along with increased investment in more costly and less certain oil recovery opportunities. Under business-as-usual conditions, the alternative fuels (natural gas, ethanol, methanol, electricity, hydrogen) will face large infrastructure hurdles and consumer inertia against change. Alternatives to diesel, which would not face the same infrastructure hurdles and consumer inertia as other alternatives fuels include biodiesel and gas-to-liquids (i.e., Fischer-Tropsch fuels). However, unconventional petroleum fuels (oil shale and tar sands) that can be used in the existing fleet will not. These options may appear to have a winning advantage but may require significant compromises in environmental quality and impacts. Society will have a choice to make in the investment path that provides the best societal return in the long-term.

Staff is qualitatively addressing scenarios of California's future petroleum outlook. At least one oil depletion scenario and possible actions to mitigate the adverse impacts of oil depletion are being qualitatively examined.

In the case of non-petroleum fuels, staff has identified the lack of convenient fueling as a market barrier to widespread commercial use of alternative fuels, such as electricity and natural gas. In addition to fueling infrastructure barriers, hydrogen, as an alternative transportation fuel, has other market barriers that are currently being addressed. Public and private sector efforts are underway to encourage early use of hydrogen in fuel cell vehicles. The California Fuel Cell Partnership, comprised of 27 private and public entities, is planning for the

establishment of hydrogen fueling at several locations throughout California. Recently, Toyota and Honda placed fuel cell vehicles in operation. Under the Commission's Public Interest Energy Research (PIER) Program, the Commission is supporting the research and development of fuel cells in stationary applications, which also can bring down the cost for mobile applications.

Schedule: Staff will prepare a report, as part of the AB 2076 proceeding, for public review by February 2003.

13. What State actions on the control of greenhouse gases should be emphasized for the transportation energy market?

The Commission has recently updated the California Greenhouse Gas Emissions Inventory, as mandated by SB 1771 (Chapter 1018, Statutes of 2000), which quantified historical total annual greenhouse gas emissions from California's major economic and energy sectors. The update identified the transportation sector as the major contributor of greenhouse gas emissions in California, contributing 58 percent of emissions from the combustion of fossil fuels. In addition, the historical trend shows the contribution to greenhouse gas emissions from the transportation sector growing at a faster rate than other economic and energy sectors.

CARB, as directed by AB 1493 (Chapter 200, Statutes of 2002), is in the process of developing and adopting emissions regulations that achieve the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks.

Given California's activities in greenhouse gases, life cycle analyses of transportation options need to include consideration of greenhouse gases. Thus, under all future transportation energy pathways and conditions, greenhouse gas emissions will need to be included in the cost-benefit analyses of competing investment options for transportation scenarios. The State's ability to support clean and reliable transportation service and a stable and healthy economy will be greatly influenced by this life cycle consideration.

Fuel efficiency and fuel-substitution options can also reduce greenhouse gas emissions. Staff is evaluating the potential for reduction of carbon dioxide and other greenhouse gas emissions, and assigning a value to carbon displaced, as well as the value of reducing other criteria pollutants. Staff is working closely with the Air Resources Board in identifying CO2 reductions through the use of advanced vehicle technologies.

Schedule: Staff will prepare a report as part of the AB 2076 proceeding, for public review by February 2003.

14. What can the State do to facilitate integrated emission reduction credit programs that clean up the mobile sector and allow desirable power plant development?

    Staff will report on what energy impact analyses would be useful to facilitate decisions by the federal EPA, Air Resources Board, local air districts and market participants on viable emission reduction credits from the mobile sector for use in cross-sector trading.

    Schedule: Staff will prepare a report on emission reduction credit options for mobile sector emissions by March 2003.

Public Interest Energy Strategies Assessment

SB1389 Section 25301(a) lists five public interests: "conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety." These goals will be achieved through a balanced portfolio of strategies. For example, achieving a reliable energy supply requires a multi-faceted approach of planning and managing the state's energy infrastructure, assessing risks and using supply, demand and price strategies in a balanced portfolio.

Section 25305 directs that the Commission shall use the forecasts and analyses developed in the Electricity and Natural Gas and Transportation Fuels and Infrastructure reports to analyze the success of and develop recommendations for public energy interest strategies on:

- Achieving energy efficiency and energy conservation
- Implementing load management
- Pursuing research, development, demonstration and commercialization of new technologies
- Promoting renewable generation technologies
- Reducing statewide greenhouse gas emissions and addressing the impacts of climate change on California
- Stimulating California's energy-related business activities to contribute to the state's economy
- Protecting and enhancing the environment.

The contributions to the public interest provided by energy efficiency, demand response, renewable generation, distributed generation and research, development and commercialization shall be addressed in this report.

Public Interest Energy Resource and Strategy Trends

1. What are emerging trends in the renewables industry, progress towards ensuring the operation of existing facilities, development of new in-state resources and environmental issues associated with renewable development?

   Implementation issues and progress toward achieving the Renewable Portfolio Standard are specifically addressed in Issue #9. Progress toward implementing the Energy Commission's Renewable Energy Program will be summarized in this report. Renewable Energy Program detail will be reported separately in the other reports required by legislation.

   Schedule: Staff product available for public review: July 2003.

2. What are emerging trends in energy efficiency, including identification of additionally achievable energy efficiency measures and technologies?

Schedule: Staff product due for public review: May 2003.

3. What is the status on energy research, development and demonstration activities that advance science or technology to provide public benefits?

   Schedule: By February 2003, Staff will describe what recent R&D findings might shape the future direction of the energy industry. At the close of this proceeding, the Integrated Energy Policy Report will provide direction to the Public Interest Energy Research program on conclusions we have reached in the issue analyses regarding promising targets for research.

4. What are the international energy market prospects for export of California technologies and business?

   Schedule: Staff product due for public review: May 2003.

5. Is voluntary conservation continuing? If not, should we develop a new emergency implementation plan?

   Staff shall analyze how much California can count on the persistence of 2001 voluntary conservation and response to higher retail rates. What drivers and constraints affect substantial demand reduction? If the voluntary conservation did not persist, are new efforts needed to recreate this source of short-term demand response, in case of future price shocks or short-term supply constraints?

   Schedule: Staff draft product due June 2003.

Public Interest Issues Analyses

6. Can we develop a demand response program that provides protection against short-term price shocks and contributes to the long-term market stability?

   Working with the joint CPUC, CEC, and CPA proceedings (CPUC R. 02.06.00 and CEC02-Demand Response-01), Staff shall document the effect of efforts to increase demand responsiveness among customers. The analysis shall address how well demand response may function as a risk management strategy to increase short-term elasticity as a means to deal with short-term price shocks. The status report shall address:

   - What has been achieved and what is feasible in the next five years?
   - Is there adequate information on how building use changes by hour and season, so that effective tariffs can be established for the different customer classes? What additional research is needed?

- How much can we count on demand responsive programs and tariffs to reduce peak? Is 1,000 MW in 2004 and 5 percent of peak demand in 2007 a realistic goal?
- Should the demand response tariffs seek to affect off-peak use?
- Should we adjust reserve margins based on the probabilistic impact of these programs?
- Are there emerging research products which will provide a reduction to technology barriers within the next three years?

Schedule: Staff draft product is due in July 2003.

7. How will the Renewable Portfolio Standard be achieved? Have barriers or resource and system issues been identified? Is legislative action needed now?

The Public Utilities Commission and the Energy Commission will be implementing the Renewable Portfolio Standard in 2003. According to the draft schedule for these proceedings, decisions will not be reached until late fall. This issue report will be a status report on selected program implementation concerns.

The Renewable Portfolio Standard is an aggressive goal for the state. Several factors can make achievement of the standard more difficult. These include:

- Remote locations of renewable generation require transmission upgrades and incremental costs. The need for new transmission to support renewable development shall be briefly addressed. The CPUC will provide a comprehensive transmission plan for renewable electric generation facilities by December 1, 2003, pursuant to SB 1038.
- The cost of renewable generation relative to market prices for electricity may lead to insufficiency of available public goods funding. This issue will be addressed in the RPS proceedings.
- The operational compatibility of renewable resources with other sources of supply as the share of renewable resources expands should be studied. This is part of the overall least cost/best fit analyses. It may have R&D implications to develop technology bundles that, in aggregate, provide net system benefits.
- Matching renewables with system needs on a least cost/best fit basis may be challenging given the shape and amount of demand already covered by long term commitments.
- Difficulty in obtaining financing for new, renewable generation may suggest a role for the CPA.
- How are the municipal utilities and direct service providers dealing with RPS?

Schedule: Staff product due in draft report, July 2003. It will be updated in September.

Long-term Risk, Vision and Opportunity Issues

8. Should the state set goals or priorities in energy efficiency? If sufficient energy efficiency is available, should the State adopt a goal of maintaining or reducing energy use per person?

   The State has adopted a goal in the renewable energy sector. The Energy Commission and the CPUC have adopted or are adopting vision statements for distributed generation and demand responsiveness. While there are several broad policy statements in support of cost-effective energy efficiency and specific program goals within energy efficiency programs, the State has not articulated a specific target for the contribution of energy efficiency.

   But, such an approach may not be productive or necessary at this time. Some of the questions that would need to be answered are: Which areas offer the most promise in terms of savings per dollar expended? How are efficiency options affected by retail rate structures, the decade-long fixed prices attributable to long-term contracts, and consumers' perceptions of the reliability of grid-based electricity?

   Schedule: Staff shall prepare a white paper and conduct a public workshop on this subject by May 2003.

9. Are there 'best practices' which the State and local governments can use to coordinate their goals for balanced energy portfolios?

   Both San Diego and San Francisco are engaged in developing integrated energy plans that balance generation, transmission, and demand options to serve their customers. These cities face substantial constraints for generation grid-based service, and so are working to shore up their local infrastructure while implementing locally preferable resource options. Energy Commission and ISO staffs already participate in these groups.

   As a special emphasis, staff shall focus on local reliability issues. Local reliability areas or local areas of the transmission system with chronic reliability and problems require specific generators within those local areas to provide must-run reliability support. Staff shall evaluate and describe local reliability problem areas and assess potential alternative solutions. The evaluation will:

   - Qualitatively analyze the transmission system using existing system studies to identify and examine why congestion and constraints exist, explore currently proposed solutions, and explore alternative solutions that are less often considered.
   - Identify a policy context for decision makers, the potential impact of proposed solutions, the potential difference in impacts if the "fixes" are, or are not, implemented in a timely manner.

Working with these local groups, staff shall report on these two efforts. Do their experiences demonstrate some 'best practices' that could be used to deal with other local energy concerns? The legislature may wish to consider if encouraging such local efforts is a desirable component of solving the state's energy problems.

Schedule: Staff will provide a draft report in July 2003.

10. What should the role of a public-interest research, development and demonstration program be in providing an affordable, reliable, clean, diverse, and secure infrastructure? What role should electric/natural gas utilities and the petroleum industry play in public-interest research, development, demonstration and commercialization?

    Lessons learned in the R&D funded so far in the Public Interest Energy Research Program are being analyzed in the PIER Annual Program Report due to the Legislature in March 2003. This report will analyze "the results achieved and the actual costs and results compared to the expected costs and benefits." As directed, staff will follow-up with any outstanding issues for the Public Interest Energy Strategies Report.

    Schedule: Staff will provide a draft analysis in June 2003.